

Project No. A-100  
THICKNESS MEASUREMENT OF  
NON-METALLIC MATERIALS  
Progress Report No. 2

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March 5, 1957

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## I. INTRODUCTION

This is a report of the work done on  Project No. A-100 during the period of February 1, 1957, to March 1, 1957. The purpose of this project is to study the behavior of ultrasonic waves in concrete and other non-metallic materials with a view to designing and constructing a portable device for measuring the thickness of samples of these materials. At the beginning of the period covered by this report we had constructed a pair of housings to hold some of the barium titanate transducers that had been obtained and we also had built an electric pulse generator to excite the transducers. In addition, some measurements had already been made.

## II. PROGRESS OF WORK

In the first transducer housing used, the ceramic was separated from the sample by a thin sheet of brass which served as the electrical contact to one side of the transducer as well as being an integral part of the housing. Under the impression that the housing itself might be responsible for the high ratio of surface waves to bulk waves, a new holder was designed with the transducer operating into a glycerine-filled cavity which was separated from the sample by a thin rubber membrane. The expedient of using unmounted transducers was also tried, as well as a crude experimental arrangement of three square transducers placed on an edge and used as length-expanders rather than as thickness expanders. In the latter case the center one was used as a sender and the outside one as receivers or vice-versa. In each case, large amounts of transducer ringing and surface waves were found.

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### III. FUTURE WORK

During the coming month, further investigations of the transducer geometry will be made in the attempt to reduce the ringing in the transducer and the generation of surface waves. For each geometry studied, the distribution of wave energy on the far side of the sample will be investigated in order to ascertain which geometry provides the best focusing of the energy.

### IV. NOTEBOOKS

The work on this project is being recorded in  Logbook  
No. C-6516.

### V. CONTRIBUTING PERSONNEL

The work reported here has been under the direction of

Some of the experimental work has been performed by

Respectfully submitted,

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